Contents

Preface vii

Conference Information viii

Chapter 1. Plenary session

Yoctocalorimetry: phonon counting in nanostructures
M.L. Roukes 1

Phonon squeezed states: quantum noise reduction in solids
X. Hu and F. Nori 16

Chapter 2. Coherent phonons

Coherent phonon avalanches
H.W. de Wijn, P.A. van Walree and A.F.M. Arts 30

Amplification of sound in the coherent regime at low temperatures in glass
S. Baumhoff, J.-Y. Prieur and J. Joffrin 34

Diffusive transport of acoustic waves in strongly scattering media
J.H. Page, I.P. Jones, H.P. Schriemer, M.L. Cowan, P. Sheng and D.A. Weitz 37

Chaotic behavior in a surface acoustic wave resonator
Y. Abe and A. Iobe 40

Coherent acoustic phonons in GaAs/AlAs superlattices
A. Bartels, T. Dekorsy, H. Kurz and K. Köhler 45

Study of coherent folded acoustic phonons in semiconductor superlattices by pump-probe technique
K. Mizoguchi, M. Hase, S. Nakashima and M. Nakayama 48

Pump power dependence of coherent phonons in η-Mo_4O_{11}
K. Kisoda, M. Hase, H. Harima, S. Nakashima, K. Sakai, M. Tani, H. Negishi and M. Inoue 51

Time resolved investigation of coherent acoustic mode oscillations in silver nanoparticles
N. Del Fatti, S. Tzortzakis, C. Voisin, C. Flytzanis and F. Vallée 54

Phonons in V_2O_3 above and below the Mott transition: a comparison of time- and frequency-domain spectroscopy results
O.V. Misochko, M. Tani, K. Sakai, K. Kisoda, S. Nakashima, V.N. Andreev and F.A. Chudnovsky 57

A Monte-Carlo analysis of the picosecond Raman spectroscopy of germanium
P. Kocevar, M. Schullatz and J. Kuhl 60

Effective isotropic media for all Laue symmetry classes – construction of second and third order elastic constants
A. Duda and T. Paszkiewicz 63

Coherent phonons in mixed semimetals and semimetal superlattices
S. Nakashima, M. Hase, K. Mizoguchi, H. Harima, K. Sakai, S. Cho, A. DiVenere and J.B. Ketterson 67

Brillouin scattering from TiN/ZrN superlattices
A. Yoshihara, W.-H. Soe and R. Yamamoto 70

Anomalous velocity change of surface wave near the gelation point
H. Okabe, K. Kuboyama, K. Hara and S. Kai 73

Two-dimensional phononic crystals: surface acoustic waves
Y. Tanaka and S. Tamura 77

Phonon hole burning at low temperature
F. Tsuruoka 81

SAW diagnostics of GaAs surface structure
T.A. Briantseva, T.J. Bullough, D.V. Lioubtchenko, I.A. Markov and E.M. Tolmachev 84

Imaging nonequilibrium phonons in Nb
M.R. Hauser, R. Gaitskell and J.P. Wolfe 87

Computer experiment on surface waves in non-linear crystals
S. Ozawa, R. Komuro and Y. Hiki 90

Acoustic spectroscopy of deep centres in GaAs/AlGaAs heterostructures
P. Bury, I. Jamnický and V.W. Rampton 94

Surface phonons in one-dimensional periodic superlattices
T. Aono, Y. Tanaka and S. Tamura 98

Chapter 3. Defects

Phonon scattering by oxygen vacancies in ceramics
P.G. Klemens 102

Pecularities of acoustic phonon scattering from a planar crystal defect and pseudosurface phonons (Resonant scattering of transverse phonons from a thin defect layer)
A. Kosevich, D. Matsokin, S. Savotchenko, D. Semagin and A. Tutov 105

Phonon scattering related to oxygen precipitation in Cz-silicon
F. Zeller, K. Laßmann and W. Eisenmenger 108

Phonon spectroscopy of D^- band tails of shallow impurity in Ge
B. Danilchenko, D. Poplavsky and S. Roshko 111

Localized waves and peculiarities of acoustic phonon scattering from a plane defect in FCC crystal
A. Kosevich, D. Matsokin and S. Savotchenko 114

Frequency dependent dielectric investigations of polycarbonate from 40 mK to 300 K at hydrostatic pressures
Th. Eggert, G. Köbernik, M. Jäckel and A. Gladun 118

Phonon scattering and IR-spectra of oxygen-related defects in gallium arsenide – aspects of quantitative phonon spectroscopy
F. Maier and K. Laßmann 122

Chapter 4. Disordered systems

Anharmonic resonators in electron-irradiated α-quartz
R. Eilenberger, K. Laßmann and W. Eisenmenger 126

Dielectric relaxation of interacting hydroxyl ions in KCl crystals
C. Enss, S. Ludwig, M. Kreft, C.P. An and F. Luty 129

Phonon hopping in disordered systems
T. Damker, V.V. Bryksin and H. Böttger 133

Universal correlations in vibrational spectra of complex crystals
G. Fagas, V.I. Fal'ko and C.J. Lambert 136

Low-frequency acoustic properties of neutron-irradiated quartz
J. Classen, I. Rohr, C. Enss, S. Hunklinger and C. Laermans 139

Tunneling–thermal activation crossover in neutron irradiated quartz
C. Laermans and D.A. Parshin 143

Anisotropic thermal transport of 2D quasicrystals of decagonal Al–Ni–Co system
M. Matsukawa, M. Yoshizawa, K. Noto, Y. Yokoyama and A. Inoue 146

Direction dependence of the tunneling states–phonon coupling in neutron irradiated quartz
V. Keppens and C. Laermans 149

Ultrasonic velocity changes in bulk neutron-disordered silicon
M. Coeck, C. Laermans and E. Peeters 152

Dynamical delocalization of one-dimensional disordered system with lattice vibration
H. Yamada and K.S. Ikeda 156

Model calculations for vibrational properties of disordered solids and the "boson peak"
W. Schirmacher, G. Diezemann and C. Ganter 160

Annealing effects in quench-condensed neon and argon films
J. Classen, J. Meier, M. Heitz and S. Hunklinger 163

The phonon-assisted shift of the energy levels of localized electron states in statically disordered solids
I.A. Weinstein, A.F. Zatsepin and Yu.V. Shchapova 167

Chapter 5. Electron–phonon interactions

Direct measurements of the electron–acoustic phonon interaction in GaAs quantum wire structures
A.J. Kent, A.J. Naylor, I.A. Pentland, P. Hawker and M. Henini 170

Exciton–phonon interaction in single and double quantum wells
A.V. Akimov 175

The absorption of surface acoustic waves by an array of quantum wires
M. Rokni and Y. Levinson 180

Angular and mode distribution of acoustic phonon emission by hot 2D electrons in GaAs: the effect of acoustic anisotropy and screening
Cz. Jasiukiewicz, D. Lehmann, A.J. Kent, A.J. Cross and P. Hawker 183

Spectroscopic evidence for cyclotron phonon emission from two-dimensional electron gases
S. Roshko, W. Dietsche and L.J. Challis 187

Electron–phonon interaction in disordered conductors
A. Sergeev, B.S. Karasik, N.G. Ptitsina, G.M. Chulkova, K.S. Il'in and E.M. Gershenzon 190

Electron–phonon dynamics in metals on ultrashort timescales
O.B. Wright, P.L. Ventzek and V.E. Gusev 193

Angle-resolved ballistic phonon absorption spectroscopy in the lowest Landau level
C.J. Mellor, U. Zeitler, A.M. Devitt, S.H. Roshko, A.J. Kent, K.A. Benedict, T. Cheng and M. Henini 196

Increase of quantum Hall plateau width by electron–phonon interaction
J. Riess, D. Bicout, T. Duguet and P. Magyar 199

Acoustic phonon absorption by a 2D electron gas in the quantised Hall regime for odd filling factors
S. Dickmann 202

Surface acoustic wave interactions with composite fermions and the acousto-electric effect
V.W. Rampton, I. Kennedy, C.J. Mellor, B. Bracher, M. Henini, Z.R. Wasilewski and P.T. Coleridge 205

Effect of nonparabolicity on free-carrier absorption in n-type InSb films for polar optical phonon scattering
C.-C. Wu and C.-J. Lin 208

Observation of energy loss by a hot two-dimensional electron gas into coupled plasmon–phonon modes
H. Al Jawhari, A.G. Kozorezov, M. Sahraoui-Tahar, J.K. Wigmore and C.D.W. Wilkinson 211

Saw attenuation by the localised states of a 2D carrier system in a magnetic field
V.W. Rampton, I. Kennedy, C.J. Mellor, B. Bracher, M. Henini, C.T. Foxon and J.J. Harris 214

Inelastic electron–boundary scattering in thin films
A. Sergeev 217

Observation of thermally activated quasiparticle interaction by ballistic electron transport and electron focusing
S. Knauth, A. Böhm and W. Grill 220

Point-contact spectroscopy of the electron–phonon interaction in $RENi_5$ (RE-rare earths)
M. Reiffers, T. Saloňová and E. Kačmarčíková 224

Heat pulse studies of the energy relaxation rate of hot electrons in n-type GaN epilayers
P. Hawker, A.J. Kent, T.S. Cheng and C.T. Foxon 227

Destruction of weak localization by phonon flux in δ-doped GaAs
D. Poplavsky, B. Danilchenko and H. Kostial 230

Energy loss of hot electrons in double barrier resonant tunnelling structures
A. Kulikowski, M. Giltrow, A.G. Kozorezov, M. Sahraoui-Tahar, J.K. Wigmore, J.H. Davies, C.R. Stanley, B. Vogel and C.D.W. Wilkinson 233

Magnetoacoustic determination of deformation potential
A.V. Tkach 236

Acoustic phonon scattering in two dimensional carriers
F.F. Ouali, H.R. Francis and H.C. Rhodes 239

Chapter 6. Glasses

Strongly localized modes as the origin of the Bose peak in glasses
T. Nakayama 243

Macroscopic quantum state of tunneling systems
S. Hunklinger, C. Enss and P. Strehlow 248

Tunneling systems with dipolar interactions
A. Würger 253

Effects of high pressure on the Bose peak in a-GeS_2 studied by light scattering
M. Yamaguchi, T. Nakayama and T. Yagi 258

On the increase of thermal conductivity in glasses above the plateau region
T. Nakayama and R.L. Orbach 261

Is there a Ioffe–Regel limit for sound propagation in glasses?
M. Foret, B. Hehlen, E. Courtens, R. Vacher, H. Casalta and B. Dorner 264

Novel existence of collective propagating mode and strongly localized mode in vitreous silica
M. Arai, Y. Inamura, T. Otomo, N. Kitamura, S.M. Bennington and A.C. Hannon 268

Thermodynamically consistent determination of the specific heat of vitreous silica down to 15 mK
P. Strehlow and M. Meißner 273

Influence of high pressure on thermal properties of amorphous polystyrene
R. Geilenkeuser, Th. Porschberg, M. Jäckel and A. Gladun 276

Low-frequency Raman scattering in bulk neutron-disordered silicon
C. Laermans and M. Coeck 280

Phonon generation by carrier recombination in a-Si:H
M. van der Voort, G.D.J. Smit, A.V. Akimov and J.I. Dijkhuis 283

Phonons and fractons in the vibration spectrum of the relaxor ferroelectric $PbMg_{1/3}Nb_{2/3}O_3$
S.G. Lushnikov, S.N. Gvasaliya and I.G. Siny 286

Spin-glass approach to low-temperature anomalies in glasses
U. Horstmann and R. Kühn 290

The influence of hydrogen charging on the glassy low temperature properties of a polycrystalline NbTi-alloy
S. Abens, A. Gladun, M. Jäckel, D. Lipp and S. Sahling 293

Thermal conductivity of Cu_xSn_{100-x} films at low temperatures
R. Schmidt, Th. Franke and P. Häussler 296

Peculiar suppression of the specific heat and boson peak intensity of densified SiO_2 glass
Y. Inamura, M. Arai, O. Yamamuro, A. Inaba, N. Kitamura, T. Otomo, T. Matsuo, S.M. Bennington and A.C. Hannon 299

Spin–lattice relaxation of paramagnetic spin in phosphate glass under high magnetic field
N. Kitamura, I. Matsubara, R. Funahashi, H. Ohta, H. Nojiri, S. Mitsudo, T. Sakon and M. Motokawa 303

Temperature dependence of depolarized spectra in n-propanol
Y. Takagi, T. Yano, M. Mikami and S. Kojima 306

Frequency and time-resolved spectroscopic study of liquid–glass transition in D-sorbitol
Y. Tsujimi, M. Kobayashi and T. Yagi 310

Rigidity percolation and structure of Ge–Se system
Y. Wang, M. Nakamura, O. Matsuda and K. Murase 313

Vibrational characteristics of cluster–cluster aggregations
T. Terao and T. Nakayama 317

Thermodynamics of irreversible heat generation in glasses at low temperatures
O.B. Wright 321

Tunneling electric dipole defects in insulating glass
G. Busiello and R. Saburova 324

Low frequency Raman peak and elastic anomaly of dehydrated heat-treated egg-white gel
A. Nakamura, K. Hara, N. Hiramatsu and A. Matsumoto 327

A study of network dimensionality in chalcogenide glass by low frequency Raman scattering
M. Nakamura, O. Matsuda, Y. Wang and K. Murase 330

Dielectric dispersion of SiO_2 glass at low temperatures
T. Ozaki, T. Ogasawara, T. Kosugi and T. Kamada 333

Boson peak in modified borate glasses
S. Kojima and M. Kodama 336

Nonequilibrium phonon propagation in vitreous silica
H. Ikari 339

Anharmonicity of vibrations and quasielastic scattering in glasses
V.N. Novikov 343

Internal friction and relaxation mechanism of F-doped SiO_2 glasses
H. Kobayashi, Y. Kogure and T. Kosugi 346

Evolutions of low-frequency Raman scattering spectrum, thermal and elastic properties of dehydrated polyacrylamide gel with increasing temperature
K. Hara, A. Nakamura, N. Hiramatsu and A. Matsumoto 350

Relaxation of thermal properties observed in glasses
Y. Hiki, H. Takahashi and Y. Kogure 353

On the wave vector dependence of the Boson peak in silicate glasses and crystals
M.J. Harris, S.M. Bennington, M.T. Dove and J.M. Parker 357

Chapter 7. Interfaces and quantum fluids

Direct phonon transmission across wafer-bonded crystals
M.E. Msall, A. Klimashov, W. Dietsche and K. Friedland 361

Observation of melting of solid ^{4}He by sound wave
Y. Okuda, S. Yamazaki, T. Yoshida, H. Fujii and K. Matsumoto 364

Hybridization scheme for the quasiparticle spectrum of superfluid ^{4}He
N. Gov and E. Akkermans 367

Mechanical responses of helium films adsorbed on two-dimensional mesoporous hectorite
M. Hieda, M. Suzuki, K. Torii, H. Yano and N. Wada 370

Fluctuation properties of third sound transmission in random media
H. Kawashima, K. Shirahama and K. Kono 373

Chapter 8. Isotope effects

Phonons in isotopically modified semiconductors and high T_c superconductors
M. Cardona 376

Raman studies of isotope effects in Si and GaAs
F. Widulle, T. Ruf, A. Göbel, I. Silier, E. Schönherr, M. Cardona, J. Camacho, A. Cantarero, W. Kriegseis and V.I. Ozhogin 381

Isotopic shifts of the low-energy excitations of interstitial oxygen in germanium
K. Laßmann, C. Linsenmaier, F. Maier, F. Zeller, E.E. Haller, K.M. Itoh, L.I. Khirunenko, B. Pajot and H. Müssig 384

Sound velocity and internal friction of Li-doped KCl
G. Weiss, M. Hübner and C. Enss 388

Chapter 9. Lattice dynamics

First-principles study of lattice-dynamical and elastic trends in tetrahedral semiconductors
T. Pletl, P. Pavone, U. Engel and D. Strauch 392

Phonon softening in ice Ih
S.M. Bennington, J. Li, M.J. Harris and D.K. Ross 396

Surface dynamics of AlSb(1 1 0) and GaP(1 1 0)
H.M. Tütüncü and G.P. Srivastava 400

Simulations of inelastic neutron scattering spectra by molecular dynamics
J. Li 404

Local structural anomalies in perovskite-type lattices
A. Bussmann-Holder 408

Phonon dispersion curves in α-SiO_2 and hcp ^{3}He and ^{4}He determined by inelastic X-ray scattering
E. Burkel, C. Seyfert, Ch. Halcoussis, H. Sinn and R.O. Simmons 412

Anomalous features in the bond stretching vibrations of $La_{1-x}Sr_xMnO_3$
W. Reichardt and M. Braden 416

The vibrational spectrum and giant tunnelling effect of hydrogen dissolved in α-Mn
A.I. Kolesnikov, V.E. Antonov, S.M. Bennington, B. Dorner, V.K. Fedotov, G. Grosse, J.C. Li, S.F. Parker and F.E. Wagner 421

Surface phonons on Si(0 0 1)/As(2 × 1)
H.M. Tütüncü, S.C.A. Gay and G.P. Srivastava 424

Neutron scattering study and lattice dynamical simulation of clathrate H_2O + He
S.L. Dong, A.I. Kolesnikov and J.C. Li 429

Ab initio phonon spectra from a supercell approach
R. Heid, K.-P. Bohnen and W. Reichardt 432

Neutron spectroscopy of fullerite hydrogenated under high pressures
A.I. Kolesnikov, V.E. Antonov, I.O. Bashkin, J.C. Li, A.P. Moravsky, E.G. Ponyatovsky and J. Tomkinson 436

Dynamics of cubic lattices with long-range interaction
E.V. Manzhelii and E.S. Syrkin 439

First principles lattice dynamics studies of the vibrational spectra of ice
I. Morrison and S. Jenkins 442

Dynamical properties of one-dimensional Lennard–Jones lattice
T. Okabe, H. Yamada and M. Goda 445

The phonon dispersion of wurtzite CdSe
F. Widulle, S. Kramp, N.M. Pyka, A. Göbel, T. Ruf, A. Debernardi, R. Lauck and M. Cardona 448

Phonon linewidths due to electron–phonon coupling in NbC
R. Bauer, A.Y. Liu and D. Strauch 452

Chapter 10. Nanostructures

Dynamic properties of phonons in superlattices
S. Tamura and S. Mizuno 455

Quantum energy flow, dissipation and decoherence in mesoscopic dielectric structures
M.P. Blencowe 459

Tailoring of optical phonon modes in nanoscale semiconductor structures: role of interface-optical phonons in quantum-well lasers
G. Belenky, M. Dutta, V.B. Gorfinkel, G.I. Haddad, G.J. Iafrate, K.W. Kim, M. Kisin, S. Luryi, M.A. Stroscio, J.P. Sun, H.B. Teng and S. Yu 462

Thermal attenuation of coherent charge oscillation in coupled quantum wells
N. Nishiguchi and M.N. Wybourne 466

The hybrid model for optical phonon confinement in AlN/GaN quantum wells
C.R. Bennett, B.K. Ridley, N.A. Zakhleniuk and M. Babiker 469

Decay of nonequilibrium phonons in nanocrystalline silicon
M. van der Voort, G.D.J. Smit, A.V. Akimov, J.I. Dijkhuis, N.A. Feoktistov, A.A. Kaplyanskii and A.B. Pevtsov 473

One phonon relaxation processes in $Y_2O_3 : Eu^{3+}$ nanocrystals
H.-S. Yang, S.P. Feofilov, D.K. Williams, J.C. Milora, B.M. Tissue, R.S. Meltzer and W.M. Dennis 476

Phonon modes in single-wall nanotubes with a small diameter
T. Maeda and C. Horie 479

Simulation of phonon propagation in fine particles
Y. Kogure 482

Intrinsic lifetimes of acoustic phonons in superlattices
M. Schmitt, A.P. Mayer and D. Strauch 486

Standing acoustic waves in GaAs/AlAs mirror-plane superlattices and cavity structures studied by Raman spectroscopy
M. Giehler, T. Ruf, M. Cardona and K.H. Ploog 489

Anion-related variations in the phonon behavior of cubic $Ga_{1-x}Al_xY$ semiconductors and $(GaY)_m/(Ga_{1-x}Al_xY, Y = As, N)_n$ superlattices
D.N. Talwar and S. Zaranek 492

Confined acoustic phonons and electron transport in quantum wires: a numerical analysis of the characteristic parameters
N. Perrin 498

Detection of nonequilibrium phonons by the exciton luminescence in CdMnTe-based quantum wells
A.V. Scherbakov, A.V. Akimov, D.R. Yakovlev, W. Ossau, G. Landwehr, T. Wojtowicz, G. Karczewski and J. Kossut 501

Acoustoconductance of quantum contacts
M.P. Blencowe and A.Y. Shik 504

Interface and confined phonons in stepped quantum wells
P. Kinsler, R.W. Kelsall and P. Harrison 507

Confined phonons and phonon-mode properties of III–V nitrides with wurtzite crystal structure
D. Alexson, L. Bergman, M. Dutta, K.W. Kim, S. Komirenko, R.J. Nemanich, B.C. Lee, M.A. Stroscio and S. Yu 510

Measuring the size of buried quantum dots using phonons
P. Hawker, A.J. Kent and M. Henini 514

Confinement of optical phonon modes in thin $(GaAs)_n(AlAs)_n$ superlattices
K. Lambert and G.P. Srivastava 517

Phase instability and electron-assisted renormalization of acoustic phonon spectrum in free-standing quantum wires
S.M. Komirenko, K.W. Kim, V.A. Kochelap, M. Dutta and M.A. Stroscio 522

Phonon emission by warm electrons in GaAs quantum wells: the effect of well width on the acoustic-optic crossover
A.J. Cross, A.J. Kent, P. Hawker, D. Lehmann, Cz. Jasiukiewicz and M. Henini 526

Thermal conductivity of GaAs/AlAs superlattices
W.S. Capinski, M. Cardona, D.S. Katzer, H.J. Maris, K. Ploog and T. Ruf 530

Surface vibrational modes and reflection times of phonons in finite-size superlattices
S. Mizuno and S. Tamura 533

Stimulated phonon emission in superlattices
S.A. Cavill, A.V. Akimov, F.F. Ouali, L.J. Challis, A.J. Kent and M. Henini 537

Localized excitations in diluted magnetic $Cd_{1-x}Mn_xTe$ semiconductor ternary alloys and $CdTe/Cd_{1-x}Mn_xTe$ superlattices
D.N. Talwar and K. Holliday 540

Confined optical phonon effects on the band gap renormalisation in quantum wire structures
C.R. Bennett, K. Güven and B. Tanatar 546

Interaction of non-equilibrium electrons with phonons in bulk GaN and GaN/AlGaN quantum wells
N.A. Zakhleniuk, C.R. Bennett, B.K. Ridley and M. Babiker 549

Chapter 11. New techniques

Scanning acoustic microscopy with vector contrast
W. Grill, K. Hillmann, T.J. Kim, O. Lenkeit, J. Ndop and M. Schubert 553

Scanning second sound microscopy with vector contrast
S. Knauth, K. Hillmann and W. Grill 559

Physical and geometrical optics of phonons
D.J. Dieleman, A.F. Koenderink, M.G.A. van Veghel, M.A. de Vries, A.F.M. Arts and H.W. de Wijn 564

Scanning phononic lattices with surface acoustic waves
R.E. Vines and J.P. Wolfe 567

Interferometric detection in picosecond ultrasonics
B. Perrin, C. Rossignol, B. Bonello and J.-C. Jeannet 571

Techniques for inelastic X-ray spectroscopy with μeV-resolution
R. Röhlsberger, E.E. Alp, E. Gerdau, O. Leupold, K.W. Quast, R. Rüffer, W. Sturhahn, T.S. Toellner and E. Burkel 574

Measuring system for the determination of nonlinear elastic and electromechanical properties in solids
U. Straube and H. Beige 577

Vibrational density of states of thin films measured by inelastic scattering of synchrotron radiation
R. Röhlsberger, W. Sturhahn, T.S. Toellner, K.W. Quast, E.E. Alp, A. Bernhard, J. Metge, R. Rüffer and E. Burkel 581

High-resolution Brillouin scattering observation of ferroelastic soft phonon, using spherical Fabry–Pérot interferometer and computer controlled spectra accumulation
M. Sanada and T. Yagi 584

Confocal scanning acoustic microscopy in air at normal conditions at frequencies close to the phonon cut-off regime
T.J. Kim, Z. Kojro, M. Pluta, M. Schmachtl, M. Schubert, T. Gudra and W. Grill 588

Chapter 12. Particle and phonon detection

On the development of superconducting tunnel junctions as photon counting spectrometers for application in astrophysics
A. Peacock 595

Particle detection using cryogenic magnetic calorimeters
J.S. Adams, S.R. Bandler, C. Enss, A. Fleischmann, S. Hunklinger, Y.H. Kim, J. Schönefeld and G.M. Seidel 604

The role of phonon processes in the performance of superconducting tunnel junctions used as photon detectors
A. Poelaert, R. den Hartog, A. Peacock, A. Kozorezov and J.K. Wigmore 607

Determination of quasidiffusive phonon propagation in BaF_2 using pulse shape analysis and possible implications for particle detection
P. Clegg, M. Bravin, N.E. Booth, M. Bruckmayer, K. Djotni, E. Esposito, E.P. Houwman, H. Kraus and G.L. Salmon 610

Back tunneling and phonon exchange effects in superconducting tunnel junction X-ray detectors
V.A. Andrianov, P.N. Dmitriev, V.P. Koshelets, M.G. Kozin, I.L. Romashkina, S.A. Sergeev and V.S. Shpinel 613

Studies of anisotropic thermoelectricity in layered oxide materials and time-resolved phonon kinetics
D. Van Vechten, K.S. Wood, G.G. Fritz, J.S. Horwitz, R.M. Stroud, R.C.Y. Auyeung, J. Kim, S.B. Qadri, A.L. Gyulamiryan, V.R. Nikogosyan and A.M. Gulian 617

Microrefrigeration and the phonon deficit effect
A.M. Gulian 621

Chapter 13. Phase transitions

Phonon softening in alpha-uranium associated with the CDW transition
J.C. Marmeggi, R. Currat, A. Bouvet and G.H. Lander 624

Observation of the coupling between TA and TO modes in $SrTiO_3$ by Brillouin scattering
B. Hehlen, L. Arzel, A.K. Tagantsev, E. Courtens, Y. Inaba, A. Yamanaka and K. Inoue 627

The structure and dynamics of hard carbon formed from C_{60} fullerene
S.M. Bennington, N. Kitamura, M.G. Cain, M.H. Lewis and M. Arai 632

Enhanced phonon scattering due to 3d-transition metal substitution for Cu in $YBa_2Cu_3O_{7-\delta}$
M. Ikebe and H. Fujishiro 636

Phase transition of zero-dimensional hydrogen-bonded crystals studied by Raman scattering
J. Watanabe, M. Kasahara and T. Yagi 640

Anharmonicity induced cooperative proton ordering in H-bonded systems
A. Bussmann-Holder 643

Elastic anomalies with the spin-state transitions in $LaCoO_3$
S. Murata, S. Isida, M. Suzuki, Y. Kobayashi, K. Asai and K. Kohn 647

Neutron spectroscopy of high-density amorphous ice
A.I. Kolesnikov, J.C. Li, N.C. Ahmad, C.-K. Loong, J. Nipko, D. Yocum and S.F. Parker 650

Soft phonon and bismuth content in ferroelectric $SrBi_2Ta_2O_9$
S. Kojima and I. Saitoh 653

Anisotropy of thermal relaxational mode in $KHCO_3$ studied by impulsive stimulated thermal scattering
S. Takasaka, Y. Tsujimi and T. Yagi 657

Phase transition and excess specific heat in RS-ARS mixed crystals
N. Noda, K. Shimizu, R. Nozaki and Y. Shiozaki 660

Phonon Raman study in $La_{1.475}Nd_{0.4}Sr_{0.125}CuO_4$
S. Nimori, H. Hata, N. Ogita, F. Nakamura, S. Sakita, N. Kikugawa, T. Fujita and M. Udagawa 663

High-pressure Brillouin study on hydrogen chloride up to 8 GPa
S. Sasaki, K. Kamabuchi, T. Kume and H. Shimizu 666

Chapter 14. Phonon interactions

Phonon dispersion and solitons in crystalline solids
H.-Y. Hao and H.J. Maris 670

Phonon scattering in HTSC cuprate crystals
V.B. Efimov and L.P. Mezhov-Deglin 674

On the phonon Poiseuille flow in quasi-one dimensional crystal
R. Maynard, A. Smontara and J.C. Lasjaunias 678

Step-wise multiphonon anharmonic decay of local modes: theory and experiment
V. Hizhnyakov, M. Selg, R. Kink, M. Kink and J. Maksimov 683

First principles calculation of the real part of phonon self energy in compound semiconductors
A. Debernardi and M. Cardona 687

Two-level-like anomalous phonon scattering in $La_{2-x}Sr_xCuO_4$ and $La_{1-x}Sr_xMnO_3$
H. Fujishiro and M. Ikebe 691

Optical studies of terahertz phonons dynamics in small-grain polycrystalline corundum
S.P. Feofilov, A.A. Kaplyanskii, A.B. Kulinkin and R.I. Zakharchenya 695

The scattering of non-equilibrium phonons on grain boundaries in single-phase ceramics
S.N. Ivanov, E.N. Khazanov, W. Lojkowski, L.M. Zhukova and A.V. Taranov 698

Diffusion of phonons in $LiY_{1-x}Ho_xF_4$
P.J. Rump, A.F.M. Arts and H.W. de Wijn 702

Heat transport in fullerite samples
V.B. Efimov and L.P. Mezhov-Deglin 705

Lattice dynamic simulation of silicon thermal conductivity
S. Volz and G. Chen 709

Anharmonic phonon decay in TeO_2: confirmation of Herring's theory
E.P.N. Damen, A.F.M. Arts and H.W. de Wijn 713

Temperature dependent phonon density of states of the invar alloy $Fe_{72}Pt_{28}$
N. Wiele, H. Franz and W. Petry 716

Anharmonic effects of phonon scattering on crystal surfaces
P. Zieliński, Z. Łodziana and T. Srokowski 719

Quantum decay of self-localized modes in anharmonic systems
A. Sauerzapf and M. Wagner 723

Propagation of phonon pulses in crystalline GaN
B. Danilchenko, M. Boçkowski, I. Grzegory, V. Guzenko, T. Paszkiewicz and T. Suski 727

Nonequilibrium acoustic phonons in diamond: generation, scattering, reflection
T.I. Galkina, A.I. Sharkov, A.Yu. Klokov, R.A. Khmelnitskii, V.A. Dravin and A.A. Gippius 730

Optical phonon attenuation in d-wave superconductors
A. Sergeev, Ch. Preis and J. Keller 733

Time-of-flight spectrum of atoms evaporated from a liquid He surface at low temperatures
T. Paszkiewicz and M. Pruchnik 736

Lattice-dynamical calculation of phonon scattering at a disordered interface
G. Fagas, A.G. Kozorezov, C.J. Lambert and J.K. Wigmore 739

Diffusion of phonons in cubic media with elastic anomalies
M.P. Blencowe, T. Paszkiewicz and M. Pruchnik 742

Phonon scattering in diamond films
V.B. Efimov and L.P. Mezhov-Deglin 745

Thermal conductivity of LaB_6: the role of phonons
K. Flachbart, M. Reiffers, Š. Molokáč, A. Belling, J. Bischof, E. Konovalova and Y. Paderno 749

Thermal conductivity minimum of $Nb_4Te_{17}I_4$
A. Bilušić, A. Smontara and H. Berger 752

Phonon dispersion effects on the motion of small polarons in molecular solids
M. Zoli 756

Ultrasonic attenuation in yttria-stabilized zirconia
K. Kirimoto, K. Nobugai and T. Miyasato 759

Nonlinear quantum dynamics of local modes: perfect and disordered alkali halide crystals
V. Hizhnyakov and D. Nevedrov 762

Saw attenuation in C_{60} thin films at transition temperature
T. Takase, Y. Sun and T. Miyasato 766

Spin-phonon interaction in thin magnetic films
E.V. Tartakovskaya and B.A. Ivanov 769

Evidence for strong electron–phonon coupling in double-layered cuprate superconductors
K. Motida and K. Suzuki 772

Phonon study of temperature evolution of strain in GaAs/Si(0 0 1) and GaAs/Si(1 1 1) heterostructures
L.G. Quagliano, Z. Sobiesierski, D. Orani and A. Ricci 775

Role of the Nb impurities on the thermal conductivity of $(Ta_{1-x}Nb_xSe_4)_2I$ alloys in the vicinity of the Peierls transition
A. Smontara, A. Bilušić, E. Tutiš, H. Berger and F. Lévy 779

The transport of non-equilibrium phonons in highly disordered ferroelectric ceramics
S.N. Ivanov, E.P. Smirnova, A.V. Taranov and E.N. Khazanov 784

Influence of Zn substitution on the thermal conductivity of Pr_2CuO_4
A.V. Sologubenko, D.F. Brewer, G. Ekosipedidis and A.L. Thomson 788

Chapter 15. Raman scattering

Anharmonicities in optical spectra of α-rhombohedral boron
K. Shirai and H. Katayama-Yoshida 791

Raman study of solid HBr under high pressure and low temperature
T. Kume, T. Tsuji, S. Sasaki and H. Shimizu 795

Temperature dependence of vibrational spectra in glass superionic conductors $(AgI)_x$–$(AgPO_3)_{1-x}$
K. Wakamura, J. Katagi and H. Takahashi 799

Spin-Peierls transition in α′-NaV_2O_5 observed by Raman scattering
H. Kuroe, H. Seto, T. Sekine, M. Isobe and Y. Ueda 803

Combined infrared and Raman study of the optical phonons of defect chalcopyrite single crystals
A. Eifler, J.-D. Hecht, G. Lippold, V. Riede, W. Grill, G. Krauß and V. Krämer 806

Resonant hyper-Raman scattering in semiconductors: Excitonic effects
A. García-Cristóbal, A. Cantarero, C. Trallero-Giner and M. Cardona 809

Polaron renormalization and lifetime broadening effects on Raman scattering under magnetic field
V. López-Richard, G.E. Marques and C. Trallero-Giner 813

Raman scattering study of $PbZrO_3$ under high pressure
H. Furuta, S. Endo, L.C. Ming and M. Kobayashi 816

Raman study of protonated H : $LiNbO_3$ thin film waveguides
I. Savatinova, I. Savova, S. Tonchev, E. Liarokapis and M.N. Armenise 819

Oxygen concentration dependence of Raman active phonons with variable Grüneisen parameter in $YBa_2Cu_3O_x$
T. Hirata 822

Raman scattering in Zn-, Si- and Mg-doped $CuGeO_3$
H. Kuroe, H. Seto, T. Sekine, T. Masuda, I. Tsukada and K. Uchinokura 825

High frequency dielectric constant of KH_2PO_4 determined by polariton dispersion relation
S. Yoshioka, Y. Tsujimi and T. Yagi 829

Raman scattering study of $Cu(Ge_{1-x}Si_x)O_3$
N. Ogita, Y. Tsunezumi, J. Akimitsu and M. Udagawa 832

Pseudo-lattice vibration in smectic liquid crystals
H. Nakayama, Y. Minagawa, S. Yajima, T. Hyuga and K. Ishii 835

List of Contributors 839

Subject Index 844